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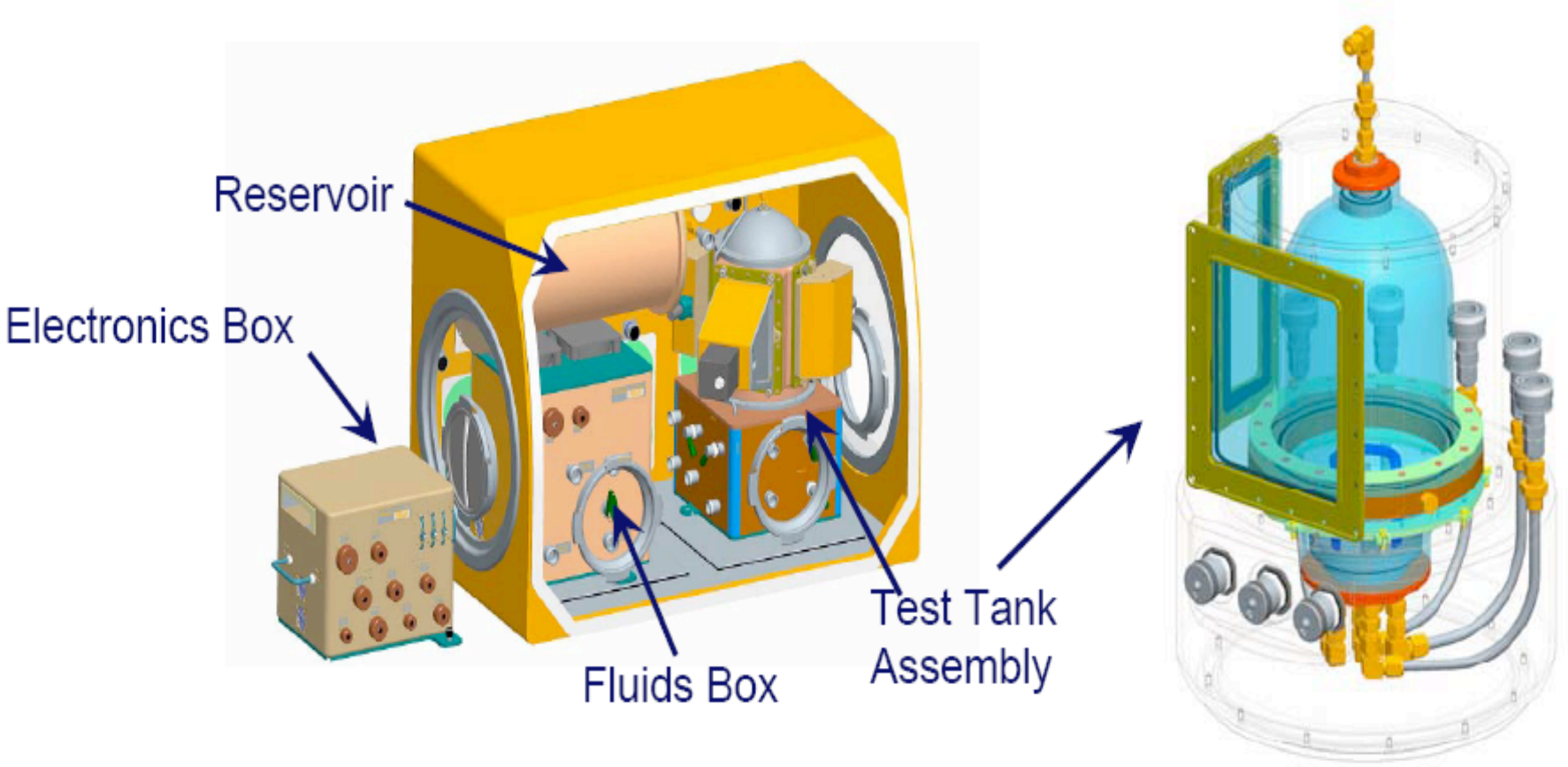
ZBOT in the MSG



ZBOT Flight Operations Summary *(Preliminary)*

- The following general steps are taken to prepare the tank before each test run in order to ensure that the tests are all started from a common initial state:
  - Set the jet temperature to the desired initial fluid temperature.
  - Set jet flow rate so that fluid will be well mixed.
  - Continue to run the jet until:
  - All thermal gradients have sufficiently decayed (i.e. until all thermistor temperatures are within +/- 0.25 oC of each other).
  - All thermistors are within +/- 0.25oC of the desired starting temperature.
  - Turn on the heater power supply and set desired heat input.
  - Configure the data acquisition system to record desired.

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Brief descriptions of the microgravity test categories:

1. **Self-Pressurization Tests**: Isolate test cell from mixing/cooling loop by valving off the jet inlet and the tank outlet. At time = 0, turn on the heater and record measurements. After a prescribed pressurization time, turn off the heaters and go back to step #1 to prep the tank for the next run.
2. **Mixing Tests**: Set desired jet speed. At time = 0, turn on the heaters allowing the tank to pressurize for a specified time period. After the pressurization time has elapsed, turn on the jet and continue to run until either the maximum allowable mixing time has elapsed or the tank pressure has returned to the initial pressure for this particular experimental run. Turn off the heaters and jet and go back to step #1 to prep the tank for the next run.
3. **Subcooled Jet Cooling/Mixing Tests**: Specify heater power, jet inlet temperature and jet speed. Specify whether jet will be active during the entire run or whether an initial pressurization will occur. For mixing throughout, at time = 0, turn on the jet and heaters. After a specified elapsed time, turn off the jet and the heaters and return to step #1. For an initial pressurization, at time = 0, turn on the heaters allowing the system to pressurize. After the pressurization time as elapsed turn on the jet. Continue until either the maximum allowable mixing time has elapsed or the tank pressure has decayed to the initial pressure. Turn off jet and heaters and return to step #1.

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- Data to be taken during the course of experiment operations:
  - Tank Pressure
  - Heat Powers
  - Temperature at all locations (inside and outside)
  - Ullage position
  - Inlet Jet Temperature
  - Tank Outlet Temperature
  - Jet Flow Rate
  - Gravitational Acceleration Data
  - Velocity Field Visualization-PIV